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Chronic CAD/Stable Ischemic Heart Disease

NOVEL ANGIOGENIC MECHANISM OF HUMAN ENDOTHELIAL COLONY-FORMING CELLS DERIVED FROM ADULT PERIPHERAL BLOOD

Poster Contributions
Poster Sessions, Expo North
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Angiogenesis is an essential biological process for organ regeneration. Endothelial colony forming cells (ECFCs), a subtype of endothelial progenitor cells, have been studied as a promising candidate for therapeutic angiogenesis. However, little is known about the cellular mechanisms of ECFCs on angiogenic process. We have recently developed the xeno-free induction protocol for human adult peripheral blood-derived ECFCs which support neovessel formation in vitro and in vivo. In this study, we investigated the angiogenic properties of ECFC compared to mature endothelial cells (HUVECs). ECFCs and HUVECs showed the similar expression pattern of panendothelial markers (CD31, CD144, KDR, Tie2). However, ECFCs revealed higher expression of Dll4 more than HUVECs. To investigate the detailed mechanism of ECFCs on angiogenic process, we adopted a novel microfluidic angiogenesis assay system. Both ECFCs and HUVECs induced lumen-forming vascular structures in this system. Interestingly, ECFCs showed more profound vessel sprouting and much larger lumen formation during angiogenic process although overall vessel lengths of ECFCs were less than those of HUVECs. Cocultivation of both ECFCs and HUVECs revealed ECFCs were predominantly localized in tip portion, suggesting that ECFC might have a role as a sprouting tip cell. Taken together, these data identify a novel role of ECFCs that involves angiogenic process. These findings provide a new insight into further optimizing therapeutic strategies involving ECFC for heart regeneration in the future.